

## ACTIVITY: INTERDEPENDENCE

### Overview

Living things are intricately woven into a web of mutual dependence on other living things and their non-living surroundings, creating a system of interdependence. Through the development of knowledge, cooperation skills, and responsible, caring behavior, students will learn the importance of stewardship and their role in maintaining a healthy environment.

### Objectives

Students will be able to

1. understand that living things are part of a system;
2. describe the relationship between the sun, plants, and animals;
3. define interdependence and give examples;
4. demonstrate appreciation to the workers in the school community for the services they provide;
5. appreciate the value of cooperation and teamwork;
6. understand that responsible, caring behavior is important to the welfare of their lives and the world they live in.

### Background

A healthy habitat provides the food, water, shelter, and space that a plant or animal needs to survive. A habitat can be as vast as a meadow for a rabbit or as limited as the underside of a rock in a stream for a caddisfly. A plant may serve as only a part of an organism's habitat (as does the milkweed plant for a monarch butterfly) or it may be the organism's entire habitat (as a plant is for an aphid). In an ecosystem, living organisms interact with and depend on other organisms and non-living things. For example, plants depend upon soil for water and nutrients and use sunlight and air to produce food through photosynthesis. Animals may get food from plants while pollinating flowers, scattering seeds, and fertilizing the soil. These interrelationships and interdependencies may be greatly affected when one or more of the habitat components is reduced or lost.

Pollution, loss of habitat, drought, and fire can negatively impact an ecosystem, or "web of life." Human restraint or intervention and responsible and caring behaviors are important factors for maintaining a healthy ecosystem.



**SCIENCE:** Life Systems

**CHARACTER:** Cooperation, Responsibility, Caring, Stewardship

#### GRADE LEVEL

2nd Grade

#### VIRGINIA STANDARDS OF LEARNING

Science 2.1, 2.5, 2.8

English: 2.1, 2.2, 2.9, 2.10

Math 2.21

#### LENGTH/DURATION

3-5 days

#### MATERIALS

name tags; yarn; notebook paper; markers; 4 poster boards; a large laminated sun; laminated construction papers with the names and pictures of a plant or animal on each (punch 2 holes in the top of each and use yarn to make a type of necklace); index cards; construction paper (different colors) with a character trait written on each: CARING, CITIZENSHIP, COOPERATION, TRUSTWORTHINESS, RESPONSIBILITY, FAIRNESS, RESPECT; "job cards" (index cards with the names of jobs found at the school)

#### VOCABULARY

interdependence, ecosystem, food chain, food web, web of life, energy, habitat, cooperation, stewardship

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### LESSON

#### Motivational Activity

Discuss and list the essential components of a healthy habitat: food, water, shelter, and space. If desired, “air” can be assumed. Note that if one of these components is missing from a habitat, a plant or animal may not be able to survive in that habitat.

Introduce the “**Habitat Chain**” tag game to illustrate the need for a complete and intact habitat. *Note:* For this activity, define the perimeter of the playing area and give clear directions on the level of physical contact allowed (gentle tagging).

In a large open area or gym, create “habitat teams” of at least 4 students each. Give each student a color-coded nametag labeled FOOD, WATER, SHELTER, or SPACE. Explain that the students represent habitat components. All four components must be on each team to create a healthy habitat.

Team members should interlock arms to form a *habitat chain*. On your signal, have the habitat teams move around the playing area. If the team members separate and break the chain, that team is out. Stop the game after 1 minute. Ask if any habitats came apart while moving. If so, why? Did the members work together as a team?

Ask the students to think of things that might harm or negatively impact habitats. Examples include pollution, flood, fire, drought, and construction. Select one student to represent one of these *habitat threats*. Then identify the habitat component that would be impacted the most by that



habitat threat. Examples: POLLUTION threatens FOOD, DROUGHT→WATER, FLOOD→SHELTER, CONSTRUCTION→SPACE. During the next round, the *habitat threat* will try to tag the identified habitat component in the habitat chains.

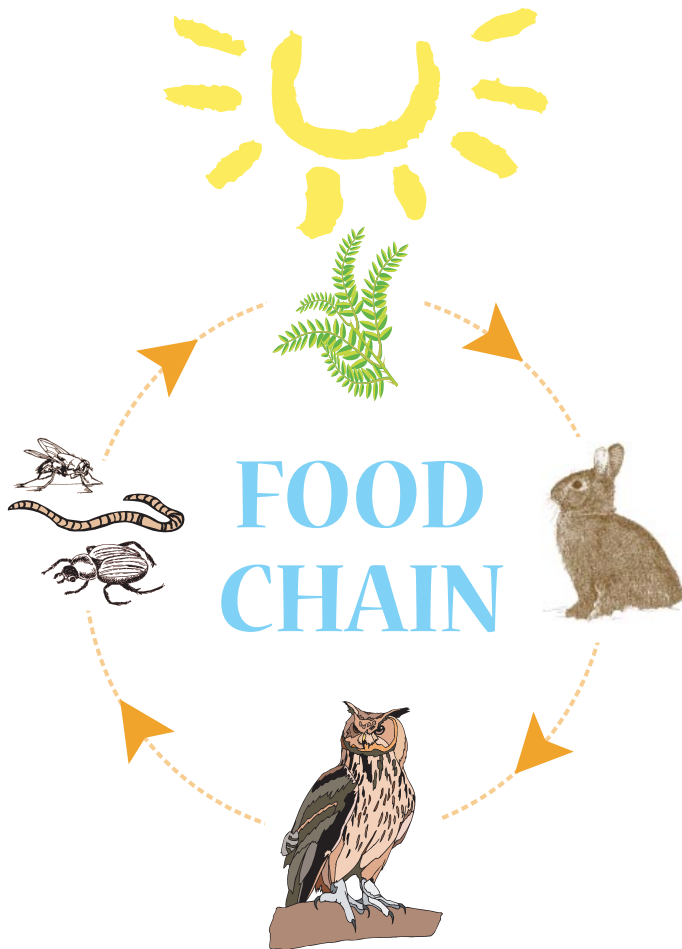
Play another round with the *habitat threat* introduced into the play area. On your signal, have the habitat teams move around the playing area while trying to avoid the *habitat threat*. If the *habitat threat* tags the identified component in a habitat, e.g., DROUGHT tags WATER, that entire habitat is *destroyed* and out of the game. If the *habitat threat* tags the incorrect component (e.g., DROUGHT tags SPACE), the habitat is not impacted and can continue to play. If a habitat chain breaks apart while trying to avoid the *habitat threat*, that team is also out. The last habitat team remaining is the strongest, healthiest habitat.

Ask the habitat teams how the *habitat threat* made them feel. Did they feel safe or threatened? Was it difficult to stay together as a team while trying to avoid the danger? What

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happened to the habitat when one component was tagged? Re-enforce the idea that all components are necessary for a healthy habitat and there are many things that threaten habitats. Ask students what can be done to protect habitats and discuss the answers.

**Options:** a) Play more rounds, adding new threats to the habitats; b) designate a “safe zone” at one end of the playing area that represents a national park that protects habitats. The habitat teams try to reach the safe zone before being tagged by the habitat threat; c) designate several park “safe zones.”



### Activities

1. Do the “Habitat Lap Sit” activity (see *Project Wild* resource).
2. Have students write their own definitions for interdependence. Allow time to share ideas and suggestions. Write the correct definition on the board and have it copied. Have students relate this to nature by brainstorming a list of plants and animals that are interdependent as they interact together for survival. Help students describe and draw *food chains* from the list. Remind them about the important role that sunlight plays as the primary source of energy.
3. Conduct a “webbing” activity to demonstrate how plants and animals depend on the sun and how they interact with each other. Have one student hold a laminated “sun” in the center of an open area with a ball of yarn in the other hand. Give each remaining student a laminated card labeled with the name and/or picture of a plant or animal. Hang the card around the student’s neck so it can be seen clearly. Form a circle around the “sun.”

Have the “sun” start by choosing a plant in the circle and explain how the sun is *connected* with that plant (provides energy). The sun should hold one end of the yarn and toss the yarn ball to a “plant.” This represents the *connection*. The plant should then choose a different plant or animal, explain the connection, hold the yarn, and pass the ball. In turn, each student should continue until the yarn has connected all the students at least once and a *food web* has been formed.



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Discuss how this web illustrates the *interdependence* of nature.

Ask the students what would happen to the web if one member *dropped out*? Who would be affected? Remove one plant or animal from the web, explaining that it is the result of drought, loss of habitat, over-hunting, or extinction. The student should gently tug on the yarn as he/she lets go. Observe the impact on the web. Who felt the tug? Have several others describe reasons for elimination, then “drop out.” Have students observe the tugs, or impacts, felt by all the other members of the web. Discuss: “Can the other plants or animals survive? Is there a *domino effect* on the components?”

Explain how the web the students formed represents an ecosystem. What are the parts of a healthy ecosystem? Include both living organisms and non-living things (water, soil, air, etc.). Have students discuss and share why it is important to protect all parts of an ecosystem and how the components are interdependent. Discuss how responsible and caring behaviors can help.

4. After learning about the interdependence of plants and animals, discuss how people depend upon each other. Use the school community to illustrate this by discussing various jobs and roles at the school and the ways in which these jobs work together.



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Place the character trait construction paper labels across the top of the blackboard to form 7 columns. Have each student choose a school “job card” and try to determine which character trait he/she thinks is most important for that job. For example, the teacher job card might best fit in the RESPONSIBILITY column while the principal job card might be placed in the FAIRNESS column. The student can lead a class discussion to arrive at a consensus and then place that job card under the chosen heading. After all cards are placed, use poster board to create a bar graph illustrating the results. What conclusion can be drawn from the graph about valued and recognized character traits in school personnel? Which trait is represented most often?

Review the term “interdependence” and guide the students to understand the importance of working together to achieve

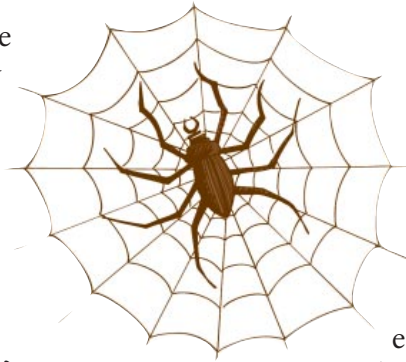
a common goal. Conclude the activity by having the students write about the importance of depending on others. Have the students give as many personal examples as they can and identify the valued character traits represented in each example.

5. Place the job cards from Activity 4 into a bucket. Review the components of a “friendly letter.” Ask each student to choose a card from the bucket and write a “thank you” letter to the person who does that job in appreciation for the work that he or she does for the school. Have the letters describe the character trait the person exemplifies. The letters may be expanded to include additional character traits observed and appreciated.
6. Discuss how the students (people) are connected to the natural environment. Do people depend on things from nature for food, water, or shelter?




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What would happen to the students if something they depended upon was no longer available? Discuss the role of national parks in protecting and preserving resources. Is this an important job? How does this job help ecosystems and food webs?



## Assessments

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1. Observe and document behavior, participation, and understanding exhibited in the classroom and in conversations.
  2. Assign students to be peer editors and to proofread each other's friendly letter.
- Evaluate the friendly letters for correctly identifying the components of a friendly letter, proper grammar and spelling, and expression of key concepts regarding character traits and interdependence.
- Evaluate the students on their ability to understand *interdependence*, relating both plants and animals and to our human

Have the students share how they might contribute to the protection and preservation of their environment. How do these actions demonstrate good character?

7. Do the “School Yard Safari” activity from *Project Learning Tree* to further illustrate the concept of interdependence.



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world. This may be in the form of a diorama, poster, skit, or written paper with criteria pre-established and posted for evaluation. Include an opportunity for presentation.



### Going Further

1. Have the students describe their interdependence with others at school and at home. Identify good character traits exhibited by students in the classroom and family members at home. Graph results and write friendly letters.
2. Extend Activity 2 (above) by having each student draw a picture of their “piece of the web.”
3. Create a bulletin board display that depicts a *web of life* using yarn to connect pictures of the sun, plants, and animals. Review concepts about interconnectedness and what happens when one member of the web is missing. Label the board “The Interdependence of Nature” and encourage students to explain it to visitors.

### Related Subject Activities

- 1 Art - Create a life-sized habitat in one corner of your room representing the different plants, animals, and components of a pond, desert, ocean, or forest habitat.
2. Music - Compose a song for the workers around the school to the tune “You Are My Sunshine,” to show appreciation for their work.

### Resources and References

*Project Wild.* Council for Environmental Education, 2000 Edition.  
“Habitat Lap Sit.” 61-63.

*Project Learning Tree.* Washington, D.C.: American Forest Foundation, 2003 Edition.  
“Trees As Habitats.” 70-71.  
“Web of Life.” 148-150.  
“School Yard Safari.” 151-152.  
“Are Vacant Lots Vacant.” 153-155.

Cornell, Joseph. “Webbing.” *Sharing Nature With Children.* California: Dawn Publications, 1998. 60-61.